DVD Audio-VIdeo / Super Audio CD Player

# DVD-3930CI

DENON

## DVD-Audio/Video & Super Audio CD Player with Full 10bit HD Video Circuit


**Video Section**

**■ I/P converter from Silicon Optix, Inc.**

The DVD-3930CI uses the 10-bit I/P converter “REALTA” developed through a joint development effort that merged image processing algorithms of Silicon Optix, Inc., and Denon video technology on the foundation of an image processing device from Teranex, a manufacturer of video processing for broadcast use in the United States. This 10-bit processing offers high conversion performance and dramatically improves motion detection capability. Regularity in pixel-level patterns are rapidly and accurately detected not only in the 3:2 patterns of film sources but in other patterns as well during I/P (Interlaced/Progressive) conversion. Even when sources contain both Video mode and Film mode material, each mode is detected and processed accurately at high speed. Flicker caused by detection delays is avoided, and Progressive playback with high picture quality is possible from a variety of discs. In addition, Multi-Directional Diagonal Filter (MDDF) technology, used for the first time in the DVD-5910CI, which accurately detects and corrects the directionality of lines on a per-pixel level to avoid "jaggies" that easily appear when video sources are I/P converted, ensuring smooth picture playback.

**■ Denon Pixel Image Correction, for more natural contour correction**

The Denon Pixel Image Correction feature that incorporates original Denon enhancement technology and makes high-definition video correction possible, has been advanced to even greater heights in the DVD-3930CI. Denon Pixel Image Correction performs detection and correction through 10-bit processing to significantly improve contour correction. This new contour correction circuit uses enhancement processing technology that also considers the influence of pixels surrounding the target pixels. It uses new algorithms to sample and analyze a total of 9 pixels of video data around, and including, each target pixel. Video images are detected and processed in vertical, horizontal, and diagonal directions at a highly detailed per-pixel level to produce contours that are visually more natural. Luminance and chroma signals are also processed with the same algorithms to suppress ringing noise and other artifacts that easily occur during enhancement. By performing the type of processing that is most effective for the current video image, the picture is free of degradation and appears more natural.

**■ High-performance video scaler capable of 1080p output for HDMI**

“REALTA” also works as the high-performance video scaler in the DVD-3930CI. This high-precision 10-bit scaler works with HDMI digital video output signals. This scaler executes optimum conversion to suit the output. Users can enjoy the best picture quality for their particular applications. Also this scaler can output PC resolution VGA/XGA/WXGA and SXGA signals.

**■ Dual Discrete Video Circuit (DDVC)**

The DVD-3930CI's video circuit features Denon's own DDVC technology designed to enhance the quality of video signals. The use of dedicated circuits – one independent block for composite and S-video signals, another block for component signals, and a dual DAC configuration with built-in video encoder – has made it possible to reproduce detailed video images with greater precision. In order to bring out the maximum quality from both video and audio signals, the DVD-3930CI has a discrete configuration in which the video, audio, and digital blocks that comprise this universal player are all completely isolated from each another in terms of their circuit configuration, boards, and power supplies. Denon engineers have used the expertise gained from their development of earlier universal players to design a configuration that thoroughly suppresses mutual interference among the circuits and prevents noise from affecting the video and audio signals.

**■ High-speed, high-precision 14-bit 216-MHz video DAC**

To ensure that high-grade video signals from the latest high-performance I/P converter are reproduced with utmost fidelity to the original images, the DVD-3930CI has an extremely fast and accurate 14-bit, 216-MHz video DAC. Oversampling of 8x for Progressive and 16x for Interlaced signals results in sharp, detailed pictures. Composite, S-video and component signals each have their own dedicated video DAC, a design that enhances the reproduction of low-level video signals and reproduces high-definition images that are faithful to the original. In addition, Noise Shaped Video (NSV) technology is used to improve the S/N of video signals and further boost their linearity.

**■ Keystone**

DVD3930CI can adjust keystone, +/- 30 degree for Vertical and +/- 40 degree for Horizontal for front projector.

**■ Supports fine picture quality adjustments**

Besides the DPIC feature, a total of 15 picture quality adjustments are possible, including contrast, sharpness, white level, chroma level, noise reduction settings, and gamma. Up to five combinations of settings can also be stored in memory, giving the user freedom to adjust picture quality in considerable detail according to individual preferences.

**■ Custom Integrated**

- **RS232C serial command control**
- **Remote in/out IR command control**
- **Discrete Power on/off command**
- **480i output capable for HDMI**

*1) Version 1.1 compliant. HDMI audio output capacity is dependent on the monitor being used.
*2) HDMI output is HDCP compliant. Video cannot be viewed if connected to a monitor that does not support HDCP; video can be viewed only on HDCP-compliant monitors.
*3) HDMI 1080p output is 50/60 Hz refresh rate only.

# DVD-3930CI

### ■ Others
- Simultaneous output possible for all video signals
- Supports PAL and NTSC

## Audio Section

### ■ Advanced AL24 Processing, original Denon technology for high-quality audio
The DVD-3930CI employs Advanced AL24 Processing, the ultimate analog waveform reproduction technology developed by Denon, for use during PCM signal input (during stereo signal processing). In addition to the data expansion of existing AL24 Processing Plus technology, algorithms developed by Denon for use in large-capacity calculation processors such as DSPs and FPGAs are used to interpolate data along the time axis and up-converted sampling is used to achieve natural interpolation without losing original data. Greater optimization in digital filtering has also been achieved for ringing-free pulse response and for pulsive music data and attack sounds. This results in more natural reproduction of spatial information such as the delicate nuances in the music, the locations of the performers, and the breadth, height and depth of the concert hall.
For multi-channel linear PCM audio playback, AL24 Processing Plus technology works to faithfully reproduce the original sound of recordings.

### ■ High-accuracy D/A converters for all channels
Two of the latest high-accuracy 24-bit, 192-kHz differential operation D/A converters have been dedicated to the two stereo channels, and three additional DACs are used for 5.1-channel playback, delivering significantly improved separation and superior S/N, dynamic range and other aspects of audio performance. Since highly accurate D/A conversion is achieved for all channels, the sonic result is refreshingly transparent. During 2-channel stereo playback, these D/A converters are used in monaural mode, operating as differential output converters independently dedicated to the left and right channels, to achieve high-quality playback of stereo signals.

### ■ Pure Direct mode, for greater purity in the audio signal
### ■ DENON Link 3rd, for high-grade audio transmission
### ■ HDMI output, for multi-channel audio
### ■ Bass management function tailored for home theater environments

## Construction

### ■ Construction designed to thoroughly suppress vibration and mutual interference among circuit blocks
- Three-box layout to isolate circuits and minimize mutual interference
- Thorough vibration-resistant construction

### ■ DENON original high-accuracy drive mechanism (S.V.H. Mechanism)

## Other Features

### ■ Supports playback of a wide variety of discs
### ■ Playback frequency ranges of Super Audio CDs are switchable (50 kHz / 100 kHz)
### ■ Independent bass management for analog audio output and HDMI audio signals
### ■ Remote controller with backlight keys
### ■ Dual Component output (BNC, RCA)
### ■ Wide pitch pin terminal

**Output Terminals For Every A/V System**

**Video outputs**
- HDMI: 1
- Component: 2 sets (RCA, BNC)
- Composite: 1
- S-Video: 1

**Audio outputs**
- Optical digital: 1
- Coaxial digital: 1
- DENON Link: 1
- Analog (L/R): 1 set
- 5.1-channel (FL/FR/C/SL/SR/SW): 1 set

**Specifications**

**Video Section**

**Signal system**
NTSC

**Disc played**
DVD Audio/Video, Music CD, SuperAudioCD, CD-R/RW(audio/MP3/WMA/JPEG), Video CD, DVD-R/RW(Video mode/VR mode), DVD+R/RW/Picture CD

**Video outputs**

Composite Video Output
1.0 Vp-p (with 75 ohms load)

S-Video Output
Y; 1.0 Vp-p (with 75 ohms load),
C; 0.286 Vp-p

Component Video Output Y, Pb/Cb, Pr/Cr:
Y; 1.0 Vp-p (with 75 ohms load),
Pb/Cb; 0.648 Vp-p (with 75 ohms load),
Pr/Cr; 0.648 Vp-p (with 75 ohms load)

**Audio Section**

**Frequency response**

DVD
2 Hz - 88 kHz (192 kHz sampling),
2 Hz - 44 kHz (96 kHz sampling),
2 Hz - 22 kHz (48 kHz sampling)

Super Audio CD
2 Hz - 100 kHz

CD, VCD
2 Hz - 20 kHz

**Signal-to-noise ratio**
120 dB

**Dynamic range**
110 dB

**Total harmonic distortion**
0.0008%

**General**

Power supply
AC 120 V, 60 Hz

Power Consumption
70 W

Dimensions
17.1"(W) x 5.5" (H) x 16"(D),
434 (W)x 139(H) x 407(D)mm

Weight
25.3lbs 11.5kg

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